ZERO RETRIES

The Newsletter of the
Northwest Amateur Packet Radio Association

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Steve Stroh N8GNJ Editor

NAPRA MEETINGS:

The June 1988 NAPRA General Meeting will be held at the Boeing Employees Amateur Radio Society (BEARS) Clubhouse at the Renton Airport on Saturday, June 11, 1988 at 1:00 P.M.

The June 1988 NAPRA Board of Directors Meeting will be held at the Omni Restaurant (in their meeting room) in Kent on Wednesday, June 15 at 7:00 P.M.

The July 1988 NAPRA General Meeting will be held at the Radio Club of Tacoma Clubhouse in Tacoma on Saturday, July 9, 1988 at 1:00 P.M.

The July 1988 NAPRA Board of Directors Meeting will be held at the Omni Restaurant (in their meeting room) in Kent on Wednesday, July 20 at 7:00 P.M.

The public is welcome to attend these or any other NAPRA meeting.

NAPRA VOICE NET:

NAPRA sponsors a Packet Radio Ragchew every Thursday night from 9:00 to 10:00 P.M. on the Evergreen Intertie Voice Repeater Network. In the Puget Sound area, the frequency is 145.33 (-600 KHz input). Any questions, comments, or news are welcome. Newcomers to packet are especially encouraged to check in.

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PRESIDENT'S MESSAGE

Budd Churchward WB7FHC

Do we really need a high speed packet link? Now, there's an interesting question! You would think that the answer would obviously be YES, especially in the packet intensive Puget Sound area. The truth is, the answer is indeed YES. However, the answer is less than obvious. Let's see why.

The first thing that came to my mind was a simple packet network consisting of two LANs each on a separate two meter frequency linked together on a common 220 backbone frequency using NET/ROM network node controllers. If a ham on one LAN is sending a file to a ham on the other, the data leaves his TNC at 1200 baud, is transferred across the backbone and down loaded to the destination also at 1200 baud. In other words, it goes in at 1200 and comes out at 1200. Apparently nothing is really gained by zipping it along the backbone at a higher speed. The truth is: if the first packet can arrive a few milliseconds sooner on a high speed backbone, the last packet will also only arrive a few milliseconds sooner. You can not multiply the time gained by the number of packets sent. If you could, the last packet of 20K file would be arriving minutes before it was sent!

See what I mean? It isn't all that obvious then. So what is the point of going to the expense and effort to create a high speed backbone?

Okay, consider the same packet network but with a second file transfer going on at the same time. Let's assume that the data in the second one is travelling across the backbone in the opposite direction. Both file servers may transmit at the same time, because they are on different frequencies. The backbone receives data at both ends simultaneously, but must divide the use of the channel between the two connections. While one linking node is unloading its burden of data, the other must store its pending packets in RAM until the backbone is clear. That is simple enough; but while this occurs, both sending nodes have received the go-ahead to transmit more packets on the two user frequencies. When the waiting node finally gets to transmit it has twice as much data to unload and ties up the backbone for twice as much time. This bottle neck results in both linking nodes clogging up with more and more data. It comes in faster than it can go out and eventually RNR (receive not ready) packets are passed back to the file servers halting the input until the congestion on the backbone can be cleared.

If the same situation described above were to occur on a high speed backbone, both linking nodes would have plenty of time to unload their burdens while waiting for the slower links upload the next set of packets. The backbone is so quick (at least 16 times as fast as the file server) that the channel is actually only in use less than 25% of the time while both user LANs are in use almost continuously.

So far we have limited the discussion to two LANs one backbone. Here in Puget Sound, however we have several LANs feeding into the same backbone. In the area closest to Seattle, there are five or more linking node controllers that hear each other and must compete for use of the channel. If each of them is simultaneously collecting data at 1200 baud but forced to take turns unloading it, the through-put for each link bogs down considerably! Frequency sharing is less orderly than you may think.

it is governed by parameters set by individual sysops who may attempt to give their LAN "an edge" on the others allowing their node to repeatedly jump in out of turn. Even if all the nodes are configured exactly the same, which gets to transmit while the others wait is still determined by a random number and one link can be held back long enough for counters to time out and disconnect some circuits. This is indeed, what your network is like right now.

By upgrading all or part of that backbone to high speed links, the increase in baud rate results in more open windows of time for other linking nodes to transmit. Recall the example above, when only two linking nodes are using the backbone. It was shown that they would use the link for less than 25% of the time. This would leave more than 75% of the time for the other 3 nodes. Clearly, five linking nodes could operate at full capacity accepting data from their respective user sides and the backbone would still not be in use 100% of the time.

The major significance of the high speed backbone is the fact that it can support so many user LANs simultaneously. If your backbone was running at 19.2 kilobaud approximately 16 LANs could feed into before it would be running at full capacity. Crowding on the user LANs will result in the same kind of congestion that we see there today, but high speed linking allows us to build many more, smaller LANs spreading the users out and away from each other. Clearly then, the next step is to upgrade the backbone to high speed so that we can encourage the creation of more low level, small area local area networks.

DIRECT AND DEADLY!

Dennis Goodwin KB7DZ

Have you ever thought: "Gee, why do I need to use the hilltop to talk to the packet bulletin board when I can get into it direct? Reading the mail and file transfers would sure go faster!" Well, I'm about to tell you why. The hilltop or network node controller acts as a traffic cop to allow all stations an equal opportunity to use the network. That's right, the simplex frequency you operate on is a network that needs to be shared by everyone. Well, if you don't allow the node to control your traffic, then others are denied the use of the network while you hog the whole show! It is akin to operating simplex on the input of a voice repeater - it just ain't right! Your traffic throughput is slower by using the node, but at least everyone gets a fair shake in using the network.

We now have intelligent linked nodes on different frequencies that allow more reliable networking. This is better than the days when we were using strings of hilltop digipeaters on the same frequency. These nodes allow 2 to 4 times the number of folks to operate on the same network frequency compared to the 'old' days. This can only work if we allow the node to act as the network traffic cop. This is a small price to pay for the benefits gained.

If we all cooperate and share the network, everyone can have fun.

Dennis Goodwin, KB7DZ @ W0LVJ, KB7DZ-8/SEAW, 144.99 MHz

EDITOR'S COMMENTS

Steve Stroh N8GNJ

I'm glad this newsletter doesn't have to be a literary masterpiece, because it isn't going to be. It was a hectic week last week- I lost my two week old hard disk in a puff of smoke, and with it all of the material that I had assembled for this issue. Unfortunately, very unfortunately, there was very little hardcopy and no backups (the disks I had ordered to put the backups on arrived the next day). So, I'm winging it a bit.

I guess a brief introduction is in order. My wife and I moved to the Seattle area from the Cleveland, Ohio area last November. I had been here about four years ago on a previous job, and had never quite gotten the Puget Sound area out of my system. We came here on vacation last year, and Tina became as infatuated with this area as I was. We decided to move, and we're very happy to be here.

I've been a ham for about three years now, and most of that has involved packet, although on a fairly low level. I consider myself a computer hobbyist who also likes radios, so packet is about perfect for me. Along with one other ham, Tom Kryza KB8CI, I was active in trying to get the Cleveland area moving towards a 220 backbone network that was forming in other areas of Ohio. It was very discouraging.

We tried to get a packet group started. Shortly before the two of us finally disbanded the group, we hosted several meetings where Tom and I were the only ones to show up. We also tried a weekly packet net, of which I was the net control. That too died due to lack of interest. I tried to get a "general interest" (spelled repeater) club that I was active in more involved in packet. I couldn't convince them to spend a dime towards packet. I was the editor of this club's newsletter, and I ran frequent articles on packet to try to stimulate interest. The only response to those efforts was a nasty letter to the editor in the first issue after I resigned.

You might wonder what all this has to do with NAPRA. Coming from an area where packet is still in "the dark ages", I have a little different perspective on the Northwest Packet Network and NAPRA's efforts (and many successes). It is truly wonderful to be involved in such a pocket of excellence as the Northwest and NAPRA.

The weekly nets, the monthly meetings, the excellent network facilities, and most of all the people are truly wonderful. My modest contribution to Zero Retries is my attempt to give something back to NAPRA, packet, and Amateur Radio for what I am sure will be many happy years bouncing packets off the network.

Two of my interests in packet (other than keyboard to keyboard QSO's) are portable packet operation and Emergency operations. In Ohio, a system of cooperation between clubs with wide coverage repeaters and the National Weather Service was a big activity. Ohio has Tornadoes touch down every year- some more serious than others, like the one than all but leveled Niles Ohio several years ago. Unfortunately, despite the obvious need, there are no large scale, reliable packet networks such as what the Northwest has. If you're into portable packet, or emergency packet operations, let me know. Better yet, write an article or two and let everyone know.

I'd like to thank NAPRA's Board of Directors and especially Peter Dahl WA7FUS for permitting me the honor of editing Zero Retries. I know I'm going to have fun trying to keep up with all the goings on in the network, and having a ball learning how good and how fun packet can really be.

Some quick notes about Zero Retries. NAPRA's Board and I would like to encourage Letters to the Editor. Any contributions should be signed and dated, and I'll try to print them in their entirety. But, I reserve the right to edit them with the permission of the author. I would like to have more packet beginners articles in Zero Retries. One of the regular features I would like to have in Zero Retries is a list of BBS' and Net/Rom Nodes with a little more detail than is available on the map. Also a list of the landline BBS' in the Puget Sound area that carry amateur radio topics. I, and the Board of Directors cannot work effectively in a vacuum. We need input from the membership about what your concerns are,

At least once a year I plan to run the NAPRA roster in Zero Retries. I plan to run selected excerpts from the minutes of the general and Board of Directors meetings. I subscribe to Gateway, the ARRL packet newsletter, and I'm a member of Tucson Amateur Packet Radio and get their excellent newsletter, the Packet Status Register. I'm also a member of Compu$erve, although not currently active. I plan to draw on all of these sources to try to keep the NAPRA membership up to date on the latest developments in packet. Most of what was lost on my hard disk were articles of this type dealing with recent developments in Digital Signal Processing, Packet satellites, a public domain implementation of Net/Rom, a TCP/IP to PBBS interface, and a NET/ROM-WA7MBL PBBS interface to allow a more direct connection between a bbs and a net rom node.

Since I'm new to the area, I'm not yet up to speed on local happenings as I'd like to be. I feel that Zero Retries is certainly an appropriate place for advertisements of hamfests and the like. If you know of a special event (like a public service), hamfest, or just something you think NAPRA members should, or would like to know about, drop me a line (a postcard will do) with the information. Member for sale and want ads are, of course, welcomed.

I also plan to try to get in contact with editors of other packet clubs and set up a newsletter exchange to keep us abreast of what's going on in other areas.

Getting articles, comments, suggestions, letters etc. to me. By mail, it's Steve Stroh, 14919 NE 163rd Street, Woodinville, WA 98072-8957. By phone, it's 206/481-5735 after 6:00 P.M. PDT. By packet, it's SP N8GNJ @ KE7OM.

Future 1988 issues	Deadlines
July/August 1988 issue	July 9, 1988
September/October 1988 issue	August 13, 1988
November/December 1988 issue	October 8, 1988

TNC For Sale

Pac-Comm TNC-220 pseudo dual ported TNC (Has ports for two separate radios. Only one can be used at a time, but the port can be switched by keyboard command.) I'm told that this TNC is excellent for working HF Packet, but I've only used it on VHF. A tuning indicator can be easily added to this TNC internally. Excellent condition, 32K RAM and V 1.1.4 Firmware. $125.00 Steve Stroh N8GNJ, 206/481-5735.

NODE HUNTING - WHAT IS IT?

Ren Roderick WA7QFR

Do you enjoy pitting your mind against machines?

Is Dungeons and Dragons one of your favorite pastimes?

Are you addicted to Adventure games?

Is the thought of exploring strange new worlds exciting to you?

Is DX your "cup of tea" but you are unable to work HF?

Do you enjoy "letter" games and deciphering abbreviations?

Would you like to "...go where no man has gone before..."? (Play Star Trek theme here!)

If you answered "yes" to any of these questions, then maybe NET/ROM node hunting is for you!

Yes, you can be your own dungeon master. Or if you prefer you can lead the "landing party" or "away team". Instead of a "tricorder" and "long range scanners" you have at your command your brains, your terminal or computer, your tnc and radio, and your determination.

The rules for node hunting/dxing are basically simple, use the tools listed above and the simple commands available at the nodes to wind your way throughout the continent. You may even find your signal going into outer space on its way from one coast to the other.

Let me relate a typical "node adventure" session. (Play Twilight Zone theme now....beedoo beedoo beedoo beedoo).

Late one evening after doing the dishes, mowing the lawn and vacuuming the house (yeah right! All in one night!....), physically tired but mentally alert (who is he kidding?) you sit down for a at you packet station to check into the local bulletin board to see what new message have appeared. Before connecting to the local node in preparation for logging into the bbs, you set MONITOR ON to see who else is on. Watching the packets fly across your screen you see:

SEA>WA7QFR-1:SEA:WN7ANK-8} Connected to SNJOSE:N7FSP-11

appear out of nowhere. SNJOSE you ask. Hmmm could this be San Jose, California? Amazing! Watching further you see:

SEA>WA7QFR-1:SNJOSE:N7FSP-11} Connected to #WWORM:WB6FFC-1

Worms? On packet radio. What's going on here? Continuing to watch you see:

SEA>WA7QFR-1:#WWORM:WB6FFC-1} Connected to UMD:WA3YMH-1

Now with your curiosity getting the best of you, you dig out that old callbook and look up some of these callsigns. Hmmm WA3YMH has a Maryland address, maybe UMD stands for the University of Maryland. WB6FFC is indeed in California. Watching further on you screen you see:

SEA>WA7QFR-1:UMD:WA3YMH-1} Nodes:
DCA3:K3AF-3 WASHDC:K3AF-5 DCA4:K3AF-4 DCA:K3AF
ELK:WB4APR-6 CPA:AK3P-5 SFO:W6AMT PALO4:W6LOH-8
BALTO:W3GXT-5

Quickly you check your callbook. Hmmm! K3AF is shown as the Andrews Air Force Base Amateur Radio Club callsign and AK3P has a Pennsylvania address. You wonder, does WASHDC stand for Washington D.C. and does CPA mean Certified Public Accountant or Central Pennsylvania.

What you've been watching is the packet network in action. Yes, WASHDC is in the nations capital and CPA means Central Pennsylvania.

Looking closer at the screen you notice SFO. Now where have you seen this before? Thinking deeply, the airport flashed to mind, then a suitcase with a label attached to the handle. Yes that's it. Now what does it stand for? Oh yes, the suitcase was headed for San Francisco.

Thinking back, you remember hearing something somewhere about a bbs with information files on Net/Rom . You're right, the KD7NM BBS accessible from the SEAW:KB7DZ node on 144.99 has a series of files with names beginning with NET/ROM. Located in those files are information on the use of the nodes and the commands you will need to begin your adventure.

The commands used the most in node dxing are the Connect or C command, the Users or U command, the Nodes or N command, the Routes or R command and the CQ command.

The C command works just like it does from your TNC.

The U command shows you several things like who is using the node, where they are connected to/from, and the version of the node software.

The N command will return a list of the other nodes that the one you are connected to knows about. If you use the N command in the form N Nodename (e.g. N SNJOSE when you're connected to SEA) you will get a listing of the various ways that SEA knows of getting to SNJOSE.

The R command will give you a list of the other nodes that the node you are connect to can contact directly. The R command was added to the NET/ROM software at version 1.2.

Finally, the CQ command which was added to the NET/ROM software in version 1.3 allows you to call CQ from the remote node. An example of its usage would be (assuming you have managed to connect to the BALTO:W3GXT-5 node):

CQ Hello from Seattle. Is anyone on in the Baltimore Area?

Many cross country QSO's have been started using this command.

Armed with these commands, some paper for notes and a little patience it is possible to work stations from British Columbia, Canada to San Diego, California. From Seattle to W1AW in Connecticut to stations in Florida. Paths exist into Utah, Wyoming, New Mexico, Nevada, Colorado and Arizona. Ohio and Illinois are also seen.

Above all, have fun but don't be surprised if you start out one evening and find yourself still chasing nodes when the sun comes up the next morning.

NOTE: NET/ROM is a trademark of Software 2000.

[I was planning to title this article "Net-Roaming", but Ren had his own title already. Still, it was too good a pun to go unmentioned. It's probably too good to not have been thought of already.- Ed.]

1988 ARRL National Convention is Coming Soon!

If you missed Dayton this year, the next best thing is probably the 1988 ARRL National Convention, September 9-11 in Portland, OR. I've been told that Bud Churchward WB7FHC will be one of the speakers, and he'll be talking about the Northwest Packet Network. For general information, call 503/640-5456 or write to 1988 National, c/o N.A.R.C., P.O. Box 25088, Portland, OR 97225.

AX.25 Protocol Not Adequate for Commercial Use?

I recently read an interesting article in Communications (a magazine for the commercial two-way radio industry) about the increasing importance of Packet Radio technology in commercial and public safety communications. The most interesting aspect of the article was the description of "a recently developed radio protocol called Collision Avoidance Radio Multiple Access (CARMA), which greatly enhances the transmission of data by packet radio over that used in the AX.25 scheme". The article is Protocols: Bridge for Data By Packet Radio. It appeared in the May, 1988 issue of Communications, pages 100-102, 103, 106, 110, 114-115. I'll try to have this issue at the next General meeting.

NAPRA Technical VP, Bob Donnell KD7NM . . .

has developed a circuit that will inhibit the transmission of packet signals for an adjustable period of time after the PTT line is enabled. The problem this is intended to cure is thought to be that some synthesized radios transmit while the PLL is still locking on to the proper transmit frequency. Unfortunately, audio from the TNC might be deviating the signal enough to allow a very brief signal to sweep through the input frequencies of several voice repeaters. Bob is soliciting comments on his circuit from others around the country. If you'd like more information, connect with the KD7NM PBBS on 144.99.

Public Domain Net/Rom Controversy

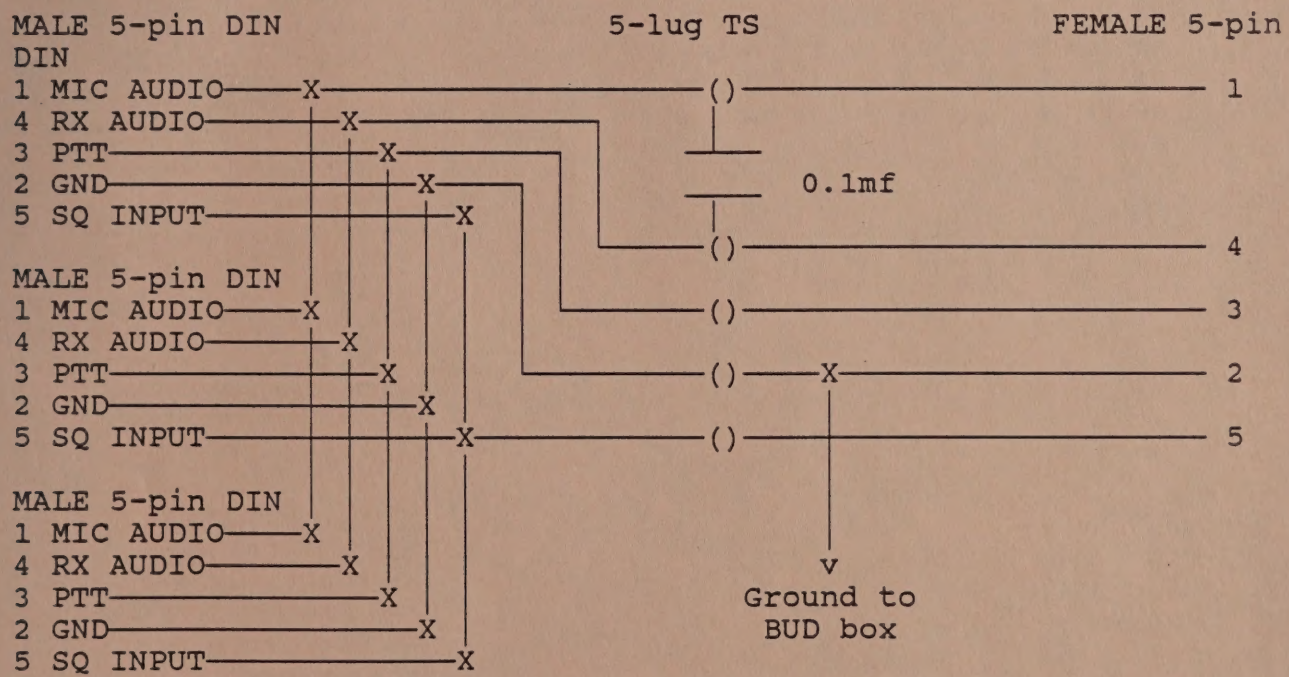
There seems to be a lot of mud flinging going on about a public domain implementation of the Net/Rom software. Software 2000, who wrote Net/Rom, seems to be of the opinion that the public domain software is essentially a copy of Net/Rom, because a byte-by-byte comparison of the two was very similar. The German group that developed the public domain version staunchly insists that nothing of the kind happened, and that the similarities are possibly a result of both parties using the same compiler and optimization software to develop the programs.

A Simple TNC Multiplexing System

Tom Hogan WB7DCH

The circuit to allow several TNCs to be muxed into a single radio is quite simple. Essentially, the signals to/from each sink/source are wire-ORed together and a capacitor ties the audio inputs and outputs together. The value of the capacitor is the same as that used in the TNC-2 to tie the output back to the input when doing a local loop test.

I constructed the unit in a 2" x 2 3/4" x 1 3/4" BUD box containing a 5-lug terminal strip mounted across the center (1 lug grounded). I mounted a standard female 5-pin DIN socket on one end (as found on most TNCs) and ran three 5-conductor shielded cables into the other end. I tied a knot in the cables inside the box for strain relief. On each of the three cables I attached a male 5-pin DIN connector to mate with the DIN connector on a standard TNC-2. My unit is capable of muxing 3 TNCs into one radio. I only needed two, but I knew I'd hate myself later if I had only allowed for two.



The advantage of this solution is that you don't have to build any new cables. Any standard TNC-2 to radio cable that you already have made up can be plugged into the female 5-pin DIN socket on the BUD box. The disadvantage of this solution is that there is some attenuation of the TNC audio output (at least when you are using a 2AT). The audio attenuation may be a blessing as most of us are running way too hot anyway. Ideally, the deviation should be set at 2.5 KHz or less.

Tom WB7DCH @ WB7DCH

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